

THOMAS WALTER'S SPECIES OF *HEDYSARUM* (LEGUMINOSAE)

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ABSTRACT

Thomas Walter, author of *Flora Caroliniana* (1788), treated twelve species as members of the genus *Hedysarum* (Leguminosae). With one exception, his names have been overlooked in monographic and floristic studies. Walter's names are here associated with the modern species they represent, within the genera *Desmodium* and *Lespedeza*.

KEY WORDS: Thomas Walter, *Flora Caroliniana*, Leguminosae, *Hedysarum*, *Desmodium*, *Lespedeza*

RESUMEN

Thomas Walter, el autor de *Flora Caroliniana*, examinó doce especies como miembros del género *Hedysarum* (Leguminosae). Con una excepción, sus nombres se han pasado por alto en estudios monográficos y florísticos. Los nombres de Walter están aquí asociados con las especies modernas que representan, dentro de los géneros *Desmodium* y *Lespedeza*.

Thomas Walter, pioneer botanist and rice-plantation owner on the Santee River, Berkeley County, South Carolina, recognized 1056 species in his *Flora Caroliniana* (1788), the first treatment of American plants to use the Linnaean sexual system of classification and binomial nomenclature. Of these, over 400 were of species he believed to be new, while others were taken from the works of Carl Linnaeus. Many of Walter's names are in common use today and are readily recognized in American floras by the author designation "Walt." But an appreciable number of his names were described so briefly (in Latin) or without clear distinction from other species that later authors have been unable to interpret his meaning, either to acknowledge his names as new or to assign them to appropriate synonymic status.

No index has yet been prepared that fully identifies Walter's names. Later authors have from time to time dipped into his *Flora* and determined as best they could the meaning of the names he gave to members of a given genus or family. Most importantly, Hitchcock (1905) has surveyed the grasses, Dayton (1952) the pines, Wilbur (2002) the oaks, and Ward (2010) the plants referred to by Walter as *Melanthium* (Liliaceae). The present task is to puzzle out the twelve species Walter assigned to the genus *Hedysarum* (Leguminosae).

Hedysarum L. is not a generic name familiar to botanists of the American Southeast. It was used by Linnaeus (1753, 1759, 1762) as a sizable assembly of vaguely related legumes, long since divided into smaller, more discrete generic groupings. *Hedysarum* s.s. is still recognized as a genus of about 100 north temperate species (Mabberley 1997: 331), none of which occur south of Maine or Vermont. The segregate known as *Desmodium* Desv. is a rather large, mostly herbaceous genus with peculiar jointed uncinata fruits, while *Lespedeza* Michx. is a distinct genus of herbs or sub-shrubs with indehiscent one-seeded fruits and pinnate trifoliolate leaves.

Because of their commercial importance, the legumes have received thorough taxonomic examination. Two surveys of the family are of note: the meticulously described legumes of North Carolina (Wilbur 1963), and the comprehensive understanding of the southeastern U.S. legumes (Isely 1990).

Eastern species of *Desmodium* fall into two sections: a group of three species with peculiar long-stipitate fruits well monographed (with their Asian allies) by Isely (1951), and a larger group of species best understood by Schubert (1950) and supplemented by Isely (1983). American species of *Lespedeza* have been carefully studied by Clewell (1966). Indicative of the neglect vested upon many Walter names, none of these authors has addressed those species of interest hidden in Walter's *Hedysarum*.

Association of the names of *Hedysarum* used by Walter with the names recognized by modern botanists

is not straightforward. Unlike in *Quercus*, where Wilbur (2002) was equating the dozen Walter names with a modern-day Berkeley County species-list of near-equal numbers, Walter's *Hedysarum*, consisting of both *Desmodium* and *Lespedeza*, is more lengthy and uncertain. Walter recognized twelve species of *Hedysarum*. The county-record maps prepared by Wilbur (in Radford et al. 1968) indicate nineteen species of *Desmodium* and twelve species of *Lespedeza* to be expected on the Carolina coastal plain, with still others found not far beyond. Thus, fewer than half of the species that Walter possibly might have known can be represented in his *Flora*.

It is conceivable that the range of species available to Walter was appreciably greater than those found in the modern coastal plain flora. Though Walter, in the introduction to his *Flora*, stated he had made his observations within a 50-mile radius of his Santee River plantation, it has long been recognized that John Fraser, who in 1787 traveled into the Appalachians and as far south as central Georgia, provided Walter with materials of otherwise unknown species. Certainly, the Fraser Fir (*Abies fraseri*, Walter's "*Pinus Cedrus*"), the Showy Ladyslipper (*Cypripedium reginae*), and other distinctive species could only have come to Walter via Fraser. The role of Fraser as a source of Walter's materials should not be overemphasized, however. For commonplace-appearing species that also occur in abundance on the coastal plain, there is little logic in Fraser having gathered plants unappealing for horticulture, nor Walter in choosing them for description over materials available near his home.

Little information is available from herbarium materials. Walter himself kept no herbarium (Ward 2007a). Fraser's abundant collections were briefly available to Walter, who annotated many of the often-fragmentary specimens (Ward 2006). These specimens (the Fraser/Walter folio herbarium, Natural History Museum, London) at times give a clue to the species Walter had described in his *Flora*, though too often Fraser's specimen (perhaps collected in the Carolina mountains) is not the same as the plant intended by Walter (from near his home on the Carolina coastal plain).

Five specimens of the genus *Hedysarum* were mounted on a single page (p. 55) of the Fraser/Walter folio herbarium (either by Fraser himself or his sons), following Fraser's return to London in early 1788. All have now been given page-number/specimen-letter designations (Ward 2006). All five bear three-digit numbers identified as Fraser's field numbers, and all five have labels with handwriting identified as Walter's. These specimens, with Fraser's number, Walter's label, and its modern identification, are: (1) 55-B: "228"; "*Hedysarum violaceum*"; *Lespedeza repens* (L.) Barton. (2) 55-C: "500"; "*Hedysarum Flore magnus*"; *Desmodium cuspidatum* (Muhl. ex Willd.) Loudon. (3) 55-D: "457"; "*Hedysarum*"; (crumpled, unidentified). (4) 55-E: "615"; "*Hedysarum*"; probably *Lespedeza virginica* (L.) Britt. (5) 55-F: "721"; "*Hedysarum*"; *Lespedeza capitata* Michx. Only one of these specimens, that of *D. cuspidatum* (55-C), has been identified as corresponding to one of Walter's species of *Hedysarum* (Fernald and Schubert 1948). A second specimen, that of *L. repens* (55-B), bears an epithet used by Walter although his description more closely matches *D. lineatum* DC. True *L. repens*, a common Carolina species, does appear to have been known by Walter, but was misnamed by him as *H. violaceum* [= *L. violacea* (L.) Pers.].

Thus, identification of Walter's names must be based upon little more than the brief Latin phrase (often taken from Linnaeus) he used for description, and an estimate of the probability that Walter would have encountered the plant near his home. Where two species are of similar frequency, yet also similar in appearance and thus likely not distinguished by him, no single-species identification is possible. Where a species is common and thus surely known to Walter, the assumption is made that it *must* be found among his described species. Rare species are mostly disregarded; only where a species may be rare but with a distinctive feature seemingly described by Walter, is its rarity as an excluding trait set aside.

The following identifications are not set in stone. Thoughtful consideration of the available data and the conditions under which Walter worked may cause others to see connections that have been misunderstood here. Yet even the conclusions drawn here, imperfect as they may be, may have value in giving tentative meaning to scientific names that for too long have remained obscure.

The species Walter recognized in the genus *Hedysarum* are listed below, in the sequence as originally

published. An occasional word or phrase italicized and thus emphasized in Walter's descriptions is shown here in Roman. Abundance within South Carolina is largely inferred from the county-record maps prepared by Radford et al. (1968). A measure of the likelihood of correct identification is attempted by uniform usage of modifying adverbs preceding the name, where a simple assertion means "little room for doubt," and "probably" and "possibly" indicate increasing levels of uncertainty.

LIST OF SPECIES

WALTER'S NAME: *Hedysarum junceum* (p. 184). Linnaeus, Sp. Pl. ed. 2. 1053. 1762; misapplied.

WALTER'S DESCRIPTION: foliis ternatis lanceolatis, leguminibus uniarticulatis, pedunculis lateralibus subumbelliferis.

MODERN NAME: **Desmodium strictum** (Pursh) DC., or **Desmodium tenuifolium** Torr. & A. Gray

COMMENTS: Both *Desmodium strictum* and *D. tenuifolium* are frequent in eastern South Carolina. Walter's description is taken directly from Linnaeus, only contracted slightly by deletion of Linnaeus' "rhombis" following "uniarticulatis." Not *Lespedeza juncea* (L.) Pers., of Asia. The often single-loment fruits and lanceolate leaflets are distinctive of *D. strictum* and *D. tenuifolium*, though the description is inadequate to determine which. No specimen of either of these species is present in the Fraser/Walter herbarium (BM).

The herbarium does hold a specimen collected by Fraser (55-A), labeled "an *Hedysarum*" by Walter and annotated "*Hedysarum junceum* Walt." by A. M. Vail. It appears to be *Psoralea pedunculata* (Mill.) Vail [= *P. psoralioides* (Walt.) Cory]. But since Walter clearly intended *P. psoralioides* to be represented by his "*Trifolium psoralioides*" (p. 184), there is no reason to believe the Fraser specimen is also his "*Hedysarum junceum*."

WALTER'S NAME: *Hedysarum umbellatum* (p. 184). Linnaeus, Sp. Pl. 747. 1753; misapplied.

WALTER'S DESCRIPTION: fol. ternatis pedunculis umbelliferis, caule fruticoso recto.

MODERN NAME: Probably **Desmodium glutinosum** (Muhl. ex Willd.) Wood

COMMENTS: Infrequent in eastern South Carolina. Walter's description was taken directly from Linnaeus, with only "recto" (erect) added. Not *Hedysarum umbellatum* L., of India. The "umbelliferis" foliage seems unique to the false whorls of *D. glutinosum*; leaves of the related *D. pauciflorum* (Nutt.) DC. are spaced along the stem. No specimen is present in the Fraser/Walter herbarium.

WALTER'S NAME: *Hedysarum barbatum* (p. 184). Linnaeus, Syst. Nat. ed. 10. 2:1170. 1759; misapplied.

WALTER'S DESCRIPTION: fol. ternatis, floribus racemosis cernuis, calycibus pilosis, leguminibus biarticulatis.

MODERN NAME: **Desmodium ciliare** (Muhl. ex Willd.) DC.

COMMENTS: Frequent throughout. Walter's "biarticulatis" loment and "pilosis" calyces well fit this species. [This identification appears first to have been made by Woods (2008).] Not *Desmodium barbatum* (L.) Benth., of the American tropics. Walter's description was taken directly from Linnaeus, only slightly reordered. Articulated fruit confirms that this is a *Desmodium*. *Desmodium fernaldii* Schub., *D. glabellum* (Michx.) DC., and *D. perplexum* Schub., a complex of poorly defined species frequent in eastern South Carolina, were also considered; but were rejected (fruits often have more than two segments, calyces are scarcely pubescent). *Desmodium strictum* (Pursh) DC. and *D. tenuifolium* Torr. & A. Gray usually have one or two segments, but appear best assigned under Walter's "*Hedysarum junceum*." No specimen is present in the Fraser/Walter herbarium.

WALTER'S NAME: *Hedysarum marilandicum* ? (p. 185). Linnaeus, Sp. Pl. 748. 1753.

WALTER'S DESCRIPTION: fol. ternatis: foliolis ovatis laevibus, caule ramoso vix fruticoso, leguminibus articulatis laevibus.

MODERN NAME: Probably **Desmodium laevigatum** (Nutt.) DC.

COMMENTS: Infrequent in eastern South Carolina, more common westward. Description is modified from Linnaeus (foliis ternatis: foliolis subrotundis, caule frutescente ramosissimo, leguminibus articulatis laevibus). The articulated fruits confirm this to be a *Desmodium*, although no Carolina fruits of that genus are truly smooth

("laevibus"). Leaflets of *Desmodium laevigatum* are ovate and glabrous, and the lomentis are finely pubescent only along the sutures, otherwise smooth. *Desmodium marilandicum* (L.) DC. has smooth ovate leaflets ("ovatis" emphasized by Walter), though its fruits are "uncinulate-puberulent" (Wilbur 1963), not smooth, and it is quite rare on the South Carolina coastal plain. No specimen is present in the Fraser/Walter herbarium.

WALTER'S NAME: *Hedysarum frutescens* ? (p. 185). Linnaeus, Sp. Pl. 748. 1753; misapplied.

WALTER'S DESCRIPTION: *fol. ternatis: foliolis subrotundis, subtus villosioribus, caule ramoso, vix fruticoso.*

MODERN NAME: Probably **Lespedeza stuevei** Nutt.

COMMENTS: Common throughout. Description is largely original (Linnaeus: *foliis ternatis subovatis, caule frutescente*). *Lespedeza stuevei* fits well in that leaflets are ovate to suborbicular and densely pubescent beneath; it is also "scarcely" fruticose. The name is misapplied; true *L. frutescens* (L.) Britt. [= *Hedysarum frutescens* L.; *Lespedeza intermedia* (Wats.) Britt.] is more delicate, less pubescent, and less common (Clewell 1966). No specimen has been identified in the Fraser/Walter herbarium. [Specimen 55-F appears to be the closely related *Lespedeza capitata* Michx.; its label bears only "*Hedysarum*" in Walter's hand and "721" in Fraser's.]

WALTER'S NAME: *Hedysarum grandiflorum* Walter (p. 185)

WALTER'S DESCRIPTION: *fol. ternatis ovalibus venosis utriusque laevibus; racemis axillaribus erectis, leguminibus pendulis multiarticulatis, floribus majoribus.*

MODERN NAME: **Desmodium cuspidatum** (Muhl. ex Willd.) Loud.

COMMENTS: Infrequent throughout South Carolina. Not *Hedysarum grandiflorum* Pallas (1773); Walter's name is a later homonym and thus illegitimate. Fernald and Schubert (1948: 203) identified specimen 55-C of the Fraser/Walter herbarium as *H. grandiflorum* Walt. and referred to it as "Walter's TYPE." The specimen was labeled "*Hedysarum Flore magnus*" by Walter, who seems not to have recognized it as his own "*Hedysarum grandiflorum*," as named in his *Flora*. Having been noted by Fernald and Schubert, their typification has been corrected to neotype for *H. grandiflorum* Walt. (Ward 2007b).

WALTER'S NAME: *Hedysarum viridiflorum* (p. 185). Linnaeus, Sp. Pl. 748. 1753.

WALTER'S DESCRIPTION: *fol. ternatis acutiusculis, caule suberecto, paniculis longis erectis.*

MODERN NAME: Probably **Desmodium viridiflorum** (L.) DC.

COMMENTS: Infrequent in eastern South Carolina, common westward. Walter's description is modified from Linnaeus (*foliis ternatis acutiusculis, caule erecto, racemis longissimis erectis*). The "acutiusculis" (slightly acute) leaves describes *Desmodium viridiflorum*, but is scarcely unique. No specimen is present.

WALTER'S NAME: *Hedysarum hirtum* (p. 185). Linnaeus, Sp. Pl. 748. 1753.

WALTER'S DESCRIPTION: *fol. ternatis ovalibus, caule fruticoso, racemis ovatis, calycibus fructibusque hirsutis monospermis.*

MODERN NAME: Probably **Lespedeza hirta** (L.) Hornem.

COMMENTS: Frequent throughout. Description is largely original (Linnaeus: *foliis ternatis ovatis, floribus geminatis, leguminibus nudis venosis monospermis*). Walter's description has no point of conflict with *L. hirta*; its fruits are densely pubescent. *Desmodium ciliare* (Muhl. ex Willd.) DC. was also considered; its fruits are often single-seeded and its calyces pubescent (but scarcely hirsute). If that species, Walter's epithet has priority over that of Muhlenberg ex Willdenow (1803). No specimen is present.

WALTER'S NAME: *Hedysarum violaceum* (p. 185). Linnaeus, Sp. Pl. 749. 1753; misapplied.

WALTER'S DESCRIPTION: *fol. ternatis ovatis, floribus geminatis, leguminibus nudis venosis monospermis, caule flexuoso.*

MODERN NAME: Probably **Lespedeza repens** (L.) Barton

COMMENTS: Common throughout. Walter's description is taken directly from Linnaeus, with only "caule flexuoso" added. This fits *Lespedeza repens* rather well (flowers are solitary or in 2s or 3s; fruits are "venosis" (conspicuously veined), single-seeded; but stem is scarcely flexuous. The name is misapplied (Reveal and

Barrie 1991); *Lespedeza violacea* (L.) Pers. (= *Hedysarum frutescens*, misapplied) is very rare in South Carolina (one county). Specimen 55-B was labeled "*Hedysarum violaceum*" by Walter; it is surely *L. repens*.

WALTER'S NAME: *Hedysarum repens* (p. 185). Linnaeus, Sp. Pl. 749. 1753; misapplied.

WALTER'S DESCRIPTION: *fol. ternatis obcordatis, caule procumbente, racemis lateralibus.*

MODERN NAME: Possibly ***Desmodium lineatum*** DC.

COMMENTS: If this species, infrequent in eastern South Carolina. This seems the only procumbent *Lespedeza* or *Desmodium* with leaflets broad enough (often obovate) to be considered "*obcordatis*." *Lespedeza repens* was also considered; it is common throughout, racemes are axillary and stems procumbent, but leaflets are mostly elliptic, and it had also been suggested as Walter's *Hedysarum violaceum*. No specimen is present.

WALTER'S NAME: *Hedysarum paniculatum* (p. 185). Linnaeus, Sp. Pl. 749. 1753.

WALTER'S DESCRIPTION: *fol. ternatis lineari-lanceolatis, floribus paniculatis, caule erecto.*

MODERN NAME: ***Desmodium paniculatum*** (L.) DC.

COMMENTS: Frequent throughout. Walter's description is taken directly from Linnaeus, with "*caule erecto*" added. Linear-lanceolate leaflets fit this species, as do erect much-branched ("*paniculatis*") inflorescences. No specimen is present.

WALTER'S NAME: *Hedysarum nudiflorum* (p. 185). Linnaeus, Sp. Pl. 749. 1753.

WALTER'S DESCRIPTION: *fol. ternatis, scapo florifero aphylo paniculato.*

MODERN NAME: ***Desmodium nudiflorum*** (L.) DC.

COMMENTS: Frequent throughout. Description is modified (Linnaeus: *foliis ternatis, scapo florifero nudo, caule folioso angulato*). The long naked scape of *D. nudiflorum* is diagnostic. No specimen is present.

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